

The listing of Claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1.-7. (Canceled)

8. (Original) A circuit for detecting biomolecules *in vivo*, the circuit comprising an optical radiation source configured for *in vivo* use that emits first optical radiation; an optical radiation detector configured for *in vivo* use that detects second optical radiation emitted by excited labeled binding molecules; and a processor circuit, coupled to the optical radiation source and the optical radiation detector, that controls the emission of the first optical radiation and that receives an intensity signal associated with the intensity of the second optical radiation and transmits a signal associated with the intensity of the second optical radiation to an *ex vivo* system.

9. (Currently amended) A circuit according to Claim 8, wherein the optical radiation source is selected from a group consisting of a ~~high-powered~~ LED and a laser.

10. (Original) A circuit according to Claim 8, wherein the optical radiation detector is selected from a group consisting of a phototransistor, a photodiode, and a photomultiplier.

11. (Original) A circuit according to Claim 8, wherein the first optical radiation has a first frequency and the second optical radiation has a second frequency.

12. (Original) A circuit according to Claim 11, wherein the first frequency is greater than the second frequency.

13. (Currently amended) A circuit according to Claim 8 further comprising:
an emission filter coupled to the optical radiation source; and
an absorption filter ~~coupled~~ coupled to the optical radiation detector.

14. (Original) A circuit according to Claim 8, further comprising:
an inductor coupled to the processor, wherein the inductor provides power to the
circuit in response to a power signal received from the *ex vivo* system.

15. (Original) A circuit according to Claim 8, wherein the circuit is on a platform
having a diameter of about 2mm.

16. (Currently amended) A circuit according to Claim 8, wherein the signal is
digitally encoded ~~via the inductor~~.

17. (Original) A circuit according to Claim 8, wherein the circuit is coated with a
biocompatible optical translucent layer.

18.-28. (Canceled)

29. (New) A circuit according to Claim 8 wherein the first and second optical
radiation comprises first and second optical radiation at respective first and second
wavelengths selected to promote transmission of the first and second optical radiation
through a bio-fouling tissue on the optical radiation source and the optical radiation detector.

30. (New) A circuit according to Claim 8 wherein the circuit comprises a
chronically implantable configured for *in vivo* implantation for at least six months.

31. (New) A circuit according to Claim 8 wherein the processor circuit is further
configured to provide the signal for wireless transmission to the *ex vivo* system.

32. (New) A circuit according to Claim 8 wherein the processor circuit is configured to control the release of labeled binding molecules for excitation by the first optical radiation.

33. (New) A circuit according to Claim 8 wherein the processor circuit is configured to enable the optical radiation detector a selectable time interval after enabling the optical radiation source.